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We consider:
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We accept:
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exact references.

CONTENTS

In the next issues of RIAP Bulletin:

The repeated UFO landings on the Mzha river: the investigation continues, by V.P.Goloveshko, V.V.Rubtsov

A possible genetical trace of the Tunguska catastrophe of 1908, by Y.G.Rychkov

With many other interesting items...

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INVESTIGATION OF THE GLASS BALL AS A SUPPOSEDLY ANOMALOUS OBJECT

Valentin N. Fomenko

Summary

Here are the results of an investigation of a Glass Ball of unknown origin, some 4.4 cm in diameter, that was found at a depth of seven meters, in a layer of red clay, not far from Kasimov, Central Russia. It was supposed that the Ball fell into the category of anomalous balls and stones that are from time to time discovered in the soil, as well as on the surface of the earth.

During the investigation the Ball split up due to internal (frozen and thermal) stresses. The results obtained suggest a conventional origin for the Ball. In all likelihood, it is an intermediate product of glass manufacture, having no anomalous properties. Probably, it was made in Russia some 150–200 years ago.

Nonetheless, it seems worthwhile to continue investigation of the remnants of the Ball and to determine its age and isotopic composition with direct methods. It would allow us to prove (or disprove) in a conclusive way the conventional origin of the Glass Ball. At present it still remains more a likely supposition, than the final solution of this enigma.

This investigation was partly supported by a grant from Scandinavian UFO Information (SUFOI).

1. INTRODUCTION

The problem of paleovisits (that is, hypothetical ancient visits of extraterrestrials to the Earth — see, for example, [1]) is closely associated with the UFO problem. If there are traces providing convincing evidence of paleovisits, then the extraterrestrial origin of at least some present-day UFOs becomes more probable. By "convincing" evidence we mean, first of all, ET artifacts (ETAs), or their remnants. In principle, the nature of such traces can be ascertained with the help of modern scientific equipment. There exist a number of supposed ETAs, but none of them has been, for one reason or another, studied in sufficient detail. That is why any newly-found object that is noteworthy for its anomalousness (and which, therefore, can be a *possible* extraterrestrial artifact) must be studied with much attention.

The Glass Ball (hereafter also designated as GB, or the Ball) was found in the summer of 1983, near the town of Kasimov (in the Ryazan Region, Russia, then the USSR), at a bank of the Oka river, when a group of workers was digging a foundation pit. The workers discovered the Ball, according to their words, at a depth of seven meters, in a layer of pure red clay. Being astonished at its appearance in such a location, they gave the find to Yuriy I. Predeen, Director of Kasimov Museum of Regional Studies. The Ball remained on the desk of the Director, as a curiosity, for some ten years. Specialists working at the Museum could not come to a mutual agreement concerning its nature, age and origin.

In 1992 Y.I.Predeen wrote to Dr. Yuriy N. Morozov, a well-known Russian investigator of the paleovisit problem and a member of RIAP Scientific Council, informing him about the enigmatic find. Dr. Y.N.Morozov, in his turn, informed the RIAP Scientific Council about it and, in the autumn of 1992, Dr. Vladimir V. Rubtsov, Director of RIAP, went to Kasimov to acquaint himself with the find. Y.I.Predeen kindly proposed that he take the Ball and examine it at RIAP. The Ball was placed at the full disposal of the Institute.

When preliminarily examined, the Glass Ball showed some resemblance to the so-called "Black Ball" that had been investigated a few years ago by the present author (see Ref. 2). The latter object had some peculiarities that suggested its anomalous nature and origin. Therefore the prime aim of the GB investigation was to reveal its properties, peculiarities, characteristics and special features which would (or would not) allow the Ball to be classified as an anomalous ball or stone (cf. [3]).

It was supposed that the analysis of physical and chemical data on the Ball's structure and composition would prove or disprove its unconventional origin. However, in the course of the investigation some research directions were modified due to the results obtained. Some other directions have been abandoned, since in the last years the former Soviet system of scientific research bodies gradually collapsed, sophisticated research equipment became inoperative, and the specialists who had taken care of it left the research institutes.

That is why it proved impossible to determine the isotopic composition of the GB and its age by direct methods. Nonetheless, we arrived at the conclusion that, most likely, the Glass Ball was made by human hands and according to the technology of glass manufacture that existed in Russia 150–200 years ago. It probably was an intermediate product used by children as a toy.

At the same time, the question of the GB origin cannot be considered as finally solved. There are some problems with its possible age, the depth, at which it was found, its chemical composition, etc. Therefore we believe that, when an opportunity arises, the investigation must be continued and completed.

2. RESULTS OF THE INVESTIGATION

2.1. The Ball's shape and structure

Figs. 1–3, 7 (pages 4 & 5) show the Glass Ball as viewed from different directions. Photograph 3 was taken when the light source was located on the side of the ball "stalk". One can see that at the place of the chip, opposite the "stalk", the light passes rather freely through the shell of the GB.

The shape of the GB, as distinct from that of the Black Ball, cannot be accurately approximated by arcs in longitudinal or latitudinal directions. Figs. 4–6, 8 illustrate our attempts to determine location of the centers, as well as the curvature radii of the contours of the GB pictures that were traced from Figs. 1–3, 7. The same method was used in studies of the Black Ball, which gave us the clue to the technology of its manufacture and revealed the system of the linear dimensions of the ball with the base of 3.65 mm. Among the approximating radii of the GB there is none that would have been a multiple of this value. Therefore, geometrical characteristics of the Glass Ball and the Black Ball do not allow us to place them in the same category.

Manufacturing methods used to make these balls are also different. The Black Ball was, in all probability, cast in a metal mould. But the deviations of the GB contours from the circular lines (Figs. 4–6, 8) are so considerable that it rules out any supposition of such a kind. It seems therefore plausible to assume that the Glass Ball was manufactured with the help of a hand-operated blow-pipe.

That is why the GB is a not-so-regular spheroid with a relatively smooth surface formed by the joint action of the surface tension, the viscosity of the molten glass, the air pressure inside the bubble and the speed of its feed during the blowing. In terms of 19th-century Russian glass manufacture such a bubble was called *banochka* [4, p. 565] (which means "a small jar"). In English it should be probably named "a gob". This was an intermediate product when glass-ware was manufactured. Then it was cut off by shears.

A remnant of the "stalk" that connected the Ball with a blow-pipe may be seen in Fig. 2. A funnel-shaped recess on the inner surface of the Ball, at the place of the "stalk", is a trace of the air-blowing channel. The thickness of the GB shell gradually varies from 5.5 mm near the "stalk" to 3 mm at the opposite place, which is natural for glassblowing by hand. A concavity around the remnant of the "stalk" also suggests this process. It was formed due to a pressure drop inside the ball after it was cut off from the blow-pipe and began to cool down. Its thicker part cooled down slower and therefore, being more plastic, was slightly drawn in.

The Ball consists of yellow-green glass whose color indicates the presence of iron impurities in the sand from which the glass was made.

Within the thickness of the glass there are air bubbles, up to 1.2 mm in diameter. Around the "stalk" these are almost lacking; most frequently they are near the "equator" of the Ball. Abundance of the air bubbles is indicative of the low level of the glassmaking technology (low temperature and short time of heating). The lack of bubbles near the "stalk" indicates that a few minutes before the glass-blower began to take the molten glass from a pot, the temperature in the furnace rose. As a result, the warmed upper layer has freed itself from the bubbles.

The black inclusions in the glass (their maximum dimensions are some 3.2 x 1.8 mm) also suggest a low technological level. Probably the furnace was heated with firewood which resulted in contamination of the molten glass with small bits of charcoal. Such technology existed in Russia prior to 1880. Extensive glass production began in Russia at the end of 18th century.

Opposite the "stalk", there is a chip on the surface of the Ball that bears a resemblance to a cardioid. Radial direction of the waves of the conchoidal surface of the chip evidences tangential spreading of the glass exfoliation along the border of the layer lying approximately in the middle of the Ball's shell. It indicates that the chip originated from internal "frozen" stresses. Such stresses arise when glass is cooled down too soon. To eliminate them, glassware is usually annealed: it is heated up to a temperature lower than the temperature of softening, and then slowly cooled down during many hours or even days. Probably, the Glass Ball was not annealed correctly, which resulted in the chip on its "pole" being formed.

The same internal "frozen" stresses led to spontaneous splitting of the Ball into three parts, due to its uneven heating (see section 2.7).

The surface of the Glass Ball, except for the chip and the concavity around the "stalk", is relatively rough. The surface of the chip is neither rough, nor leached, which evidences that the chip was formed recently, being much younger than the other part of the Ball's surface. The lack of roughness on the concavity suggests that the GB became rough when it was rolled on rather a hard flat surface — such as a floor covered by some amount of sand. It is not improbable that the GB was used for a long time by children for their games.

The surface of the GB is relatively soft (except for the chip). It can easily be scratched by a needle forming very fine crumbs and demonstrating some plasticity of a thin surface layer. This evidences that before the Ball was found, it had been lixiviated when lying in a damp soil.

One can see on the surface of the GB, through a binocular magnifier, a host of semicircular mi-

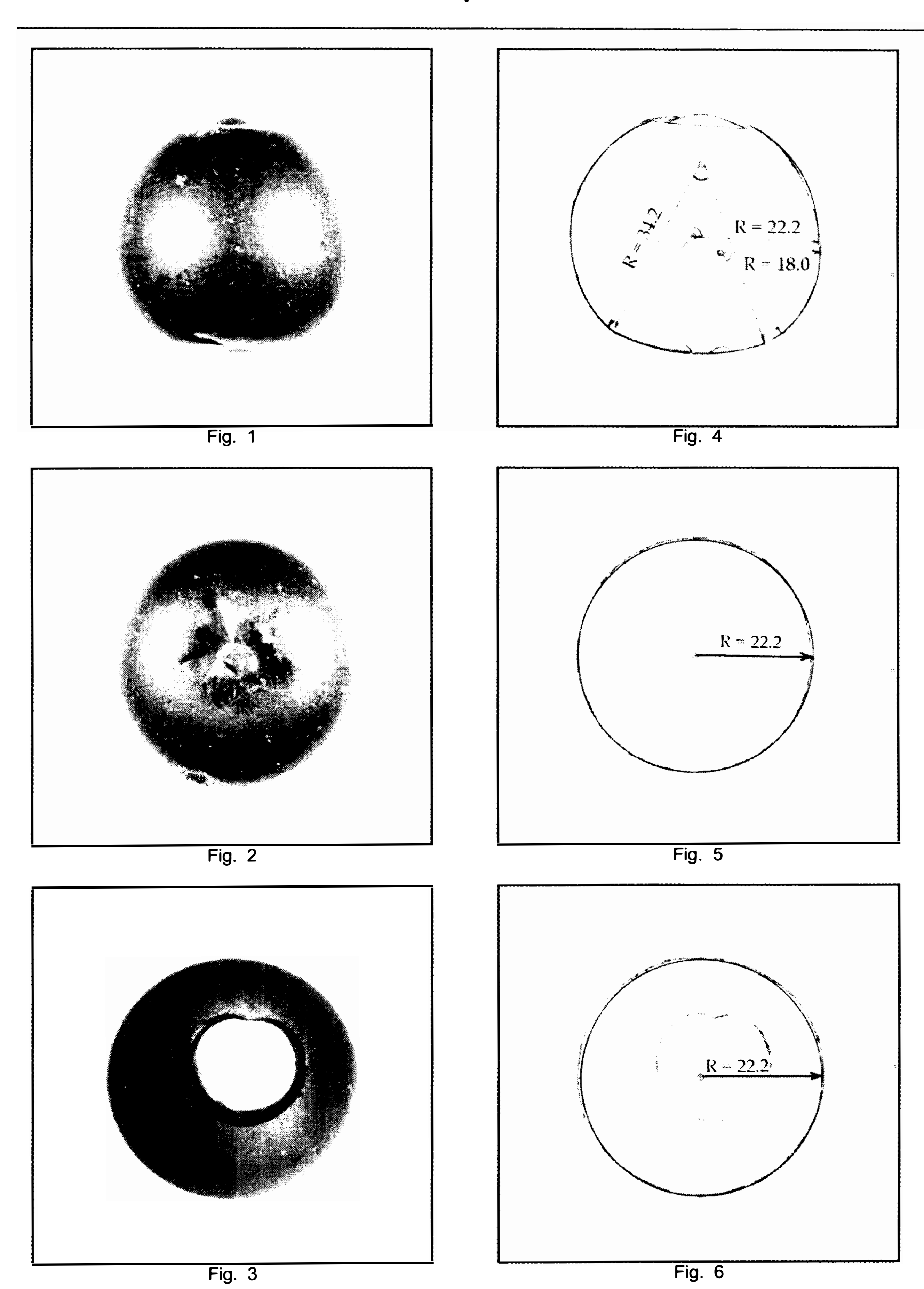


Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

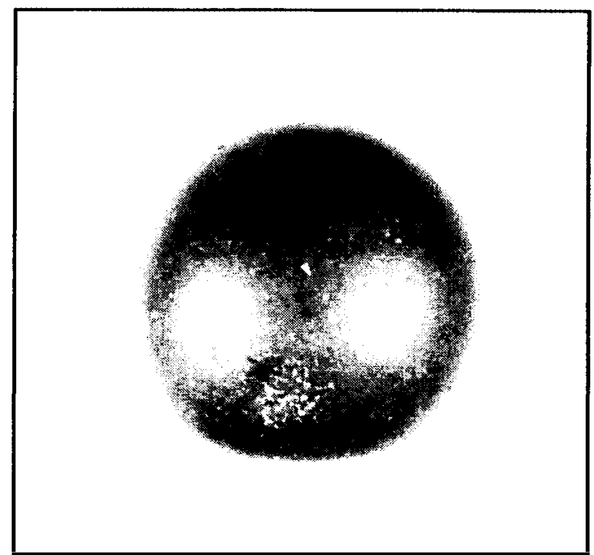


Fig. 7

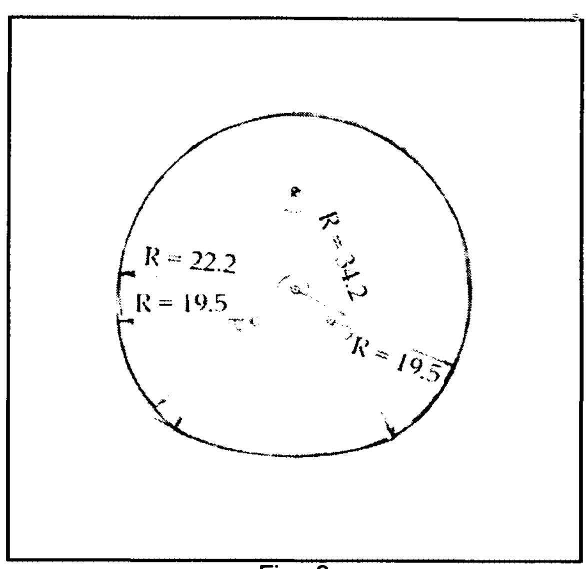


Fig. 8

crocracks whose planes are inclined at 30 to 40 degrees to the surface of the Ball. This also supports our supposition that the GB surface became rough due to grains of sand.

2.2. Chemical composition of the Ball

Results of spectral analysis of the Ball's substance are as follows: Si - some 30%, Ca - 5 to 10%, Na - 1 to 1.5%, Fe - some 1%, Mg - 0.5 to 1%, Ti - some 0.05%, Zn - 0.008 to 0.01%, Pb - 0.003 to 0.005%, Cu - some 0.003%.

Assuming that silicon and calcium are present in the substance of the Ball combined with oxygen, one can conclude that the main components of the substance are SiO_2 (some 64%) and CaO (7 to 14%). This is in accordance with our supposition about the Ball's origin, but it would be desirable, nonetheless, to analyze its substance with the help of more sensitive methods.

2.3. Determination of the Ball's density

The Ball's weight is 54.39 g. The Ball's volume is 44.58 cm^3. So, its density is 1.22 g/cm^3. This value, determined before the Ball split up, is much less than the density of normal glass. The result led to the suggestion that the Ball (if it is solid) consists either of abnormal glass, or of a glass-like resin. The density of amber is just 1.20 g/cm^3.

To check this suggestion, a few particles of the Ball's substance were taken by a needle and brought into a flame. The particles did not burn. Triboelectrification of the Ball was also checked. It was lacking almost completely.

After self-destruction of the Ball, we determined the density of its fragments. It proved to be 2.58 to 2.59 g/cm^3, which approaches the density of normal glass.

2.4. The Ball's hardness and index of refraction

As was determined, the hardness of the Ball's substance is some 6.5 on Mohs scale. Its refractive index is about 1.6. These figures do not contradict our hypothesis about the Ball's origin.

2.5. Determination of the Ball's magnetic properties

The Ball was placed on a saucer floating on the surface of water in a plastic basin. When a strong permanent magnet was placed at a distance of 1 cm from the Ball, a slight attraction of the Ball for this magnet was detected.

While floating in the basin for a long time, the Ball did not take any definite position in relation to the geomagnetic field. Instead, it remained in its initial position. Therefore, the iron impurities in the glass are in the form of separate atoms, not integrated in clusters that could have obtained residual magnetization. That is why they were not magnetized under the influence of the geomagnetic field when the glass was solidifying, nor under the influence of the strong permanent magnet (even when the Ball was slightly hit with a pole of the magnet). This suggests a slight paramagnetism of the Ball.

2.6. Study of ionizing radiation of the Ball's material

Measurements of the level of ionizing radiation from the Ball could allow to use their energy spectra to determine the content of decay products of uranium and thorium in order to date the materials from which the Ball was made. There was used for this aim a radiometer MKC-01P-01, automatically counting and recording the number of pulses from beta- and gamma-radiation for a period of 100 sec.

Various parts of the Ball were placed right up against the sensor of the radiometer: the chip, the "stalk", and a side surface in the equatorial plane. Beta-radiation of the Ball proved to be 1.63 times stronger than the radiation background. Gamma-radiation of the Ball is 1.91 times stronger

than the background radiation. This can permit determination of the age of the materials from which the Ball was made. Alpha-radiation of the Ball (measured with the same radiometer) exceeds the background level the most: by 3.15 times.

An attempt to determine the age of the Ball unfortunately failed, since the Laboratory of Nuclear Geochronology at the Institute of Nuclear Geology and Geochemistry (Moscow, Russia) has over recent years gradually lost its specialists, although the special equipment was kept.

However, with the help of A.I.Spiridonov, it became possible to determine from gamma-radiation of the Ball that its substance contains 2 x 10^{-4} % of uranium, 2 x 10^{-4} % of thorium, and 1.2 x 10^{-4} % of radium. The main constituent of the Ball's gamma-radiation is due to the decay of potassium-40. Such proportions of uranium and thorium are too low to allow determination of the Ball's age. This would have required permanent use of the equipment for 5 to 6 days, which proved to be impossible under existing conditions.

When glass is older than a few thousand years, it is possible to determine its age from the tracks of alpha-particles that remain within the thickness of glass as a result of alpha- decay of elements of the thorium and uranium series. A section of it is etched by hydrofluoric acid and these traces become observable through a microscope. From their number and length one can estimate the age of the glass. However the specialists who knew how to use this method have left the laboratory. Besides, judging from the technology of the Ball's manufacture, its age hardly exceeds a few hundred years. The low content of uranium and thorium in the Ball substance (some 10^{-4} %) also makes this method inefficient.

An attempt to determine the age of the Ball with the help of a radiocarbon analysis of the air contained in the bubbles that have remained in the Ball's glass also failed. This type of analysis is well applicable when the age of the substance is of the order of several hundred years. Unfortunately, the above-mentioned difficulties have made it impossible to use it either.

2.7. Examination of the possibility of the Ball's self-rotation

In the literature one can find assertions that in some places of our planet have been found strange balls that can self-rotate (see Ref. 3). That is why, when trying to find evidence in favor of the Ball's anomalous origin and function, we have checked whether it has this peculiarity.

There was used for this aim an intense light source with an optical system focusing a narrow beam. On the Ball was stuck a small mirror (10 x 10 x 1 mm) that reflected the beam. The light source was placed on a support at a distance of 4 m from the Ball, placed, in its turn, on a horizontal glass plate. The reflected beam fell on a dark screen, placed at a distance of 10 m from the Ball. The illuminated spot was 7 cm in diameter. Its location was marked by a pencil at five points: at the center, as well as at the 12, 3, 6, and 9 o'clock positions. The average of three 24-hour shifts of these marks was considered as its resulting shift. For instance, while trying to find a horizontal shift, we measured an average difference between locations of the lines marking 24-hour variations in the positions of the center, 3 o'clock, and 9 o'clock points.

When the small mirror was stuck at the Ball's pole, on the chip, the light spot was displaced in the vertical plane up to 20 mm per 24 hours. It was equivalent to 0.147 revolution per year. Then the mirror was stuck at the Ball's "equator" and the Ball was placed into the hole of a metal washer. After that it was established that the motion of the spot had slowed down, its speed and direction being variable. For 96 hours the beam moved at a distance 14 to 18 mm, first down, then to the left, then up, and after that it stopped. This may be interpreted as a manifestation of crushing deformations at the place of contact between the Ball and the edge of the washer.

To check this assumption, a similar experiment was made with a steel ball, 62 mm in diameter. The results were also similar: there was observed an irregular motion of the light spot (even to a greater distance, than with the Glass Ball). This clearly indicates that the crushing deformations are responsible for this motion, and the Glass Ball cannot self-rotate.

In the course of these experiments the Glass Ball has split up — probably, due to thermal stresses — when it was subjected to one-sided heating by the light beam during two hours (an experimenter forgot to turn the light source off, after he had measured a shift of the light spot). These stresses, together with "frozen" ones (see section 2.1), proved to be great enough to split the Ball into three parts.

3. CONCLUSIONS

The remarkable location where the Glass Ball was found, and the lack of an obvious explanation for its origin, warrant the investigation that was made. Any anomalous object is worthy of detailed examination, even if its results will not necessarily be positive.

Examination of the Ball's shape, structure and surface, as well as inclusions and density of the glass (after the Ball had split up), leads to the conclusion that the Ball is, most likely, an intermediate product of glass manufacture, intended

(Continued on page 12)

ESSAY

TRACKING THE ALIEN ASTROENGINEERS

Vladimir V. Rubtsov

When studying the question of possible ancient visits of alien beings to the Earth, a researcher sometimes encounters data which cannot be interpreted as yet in a strictly scientific manner, but which, at the same time, are interesting enough to be regarded seriously and unbiasedly. Such data can be found, in particular, in the well-known "mythological astronomy" of the Dogon, an African people, living mainly in the West African Republic of Mali.

The Dogon believe that the Universe is "infinite, but measurable" and is filled with "spiral stellar worlds" (*yalu ulo*), one of which contains the Sun. This world may be seen in the sky as the Milky Way. The majority of heavenly bodies represent the "external" star system, whose influence on terrestrial life is, according to the Dogon, relatively small. There exists, however, also the "internal" system, which "participates directly in the life and development of men on the Earth". It includes Orion, Sirius, Pleiades and some other stars. These celestial bodies form the "support of the seat of the world". It is Sirius that occupies the main position among them, being called the "navel of the world".

Sirius is considered by the Dogon as a triple stellar system, consisting of the stars *Sigi tolo* (our Sirius A), *Po tolo* (Sirius B, a white dwarf) and *Emme ya tolo* (the hypothetical Sirius C, yet to be discovered). Close similarity between the characteristics of *Po tolo* and Sirius B (both bodies are white, small, very heavy, with fifty-year periods of revolution around the main star) stimulated a lively discussion on the pages of scientific — and not so scientific — journals about 20 years ago. Robert Temple, in his book *The Sirius Mystery* [1], and Eric Guerrier in his *Essai sur la cosmogonie des Dogon* [2] supposed that these data (as well as other astronomical information possessed by the Dogon) were brought to the Earth by cosmic visitors. However, their reasons could not break through the "armour of denial" of established science. The hypothesis of a recent adoption of this knowledge from Europeans appeared convincing for most scientists.

It is natural that other components of the Dogon mythology, which have little in common with modern scientific knowledge, attracted even less scholarly interest. Yes, this is a real mythology, almost pure and not very simple. To analyze its content is not an easy task, and the results are not self-evident. Nonetheless, it is possible that we can derive from such an analysis some important information. Let us recall very briefly the main points of this mythology...

The supreme god Amma made the whole Universe within a grain of *po*, which is the Dogon name for fonio, the smallest kind of millet. This grain was located inside the "egg of the world"; it "spun and scattered the particles of matter in a sonorous and luminous motion", remaining, however, "inaudible and invisible" [3, p. 130]. Having opened this "egg", Amma let the spiral stellar worlds out, and it was thus that the Universe was "realized". Then the god created the first living being — Nommo anagonno. This being is described either as a half-man, half-snake having flexible limbs, without any joints, red eyes and forked tongue, or just as a fish, namely a Silurus, sheat-fish, or cat-fish. This Nommo multiplied, and there appeared four Nommos: Nommo die, Nommo titiyayne, O Nommo and, at last, Ogo, a very harmful creature. As distinct from other Nommos, he is never represented as a fish. Instead of awaiting patiently the completion of the Amma's work, he hurriedly made an "ark" and rushed into space, wishing "to look at the world". Thus, he took disorder into the young world. After several voyages, Ogo landed on the Earth and turned into the pale fox or fennec, named Yurugu.

Made indignant by Ogo's escapades, Amma took everything he had created and put it back into the grain of *po*. To "purify" the Universe, he had to sacrifice one of the Nommos. After that "by whirling and... acting as a spring, the *po*... distributed all things in the Universe" [3, p. 423]. The empty shell of the grain became the star Po. In "the first year of the life of man on Earth" this star exploded, and its brightness decreased slowly during 240 years until it completely faded.

It is interesting that there is in the Dogon mythology another image of the Sirius system. According to it, the main star represents the Ogo's female twin, Yasigui, whom he chased with some dubious intentions. One of its satellites is Ogo himself, doomed to revolve eternally around his sister, remaining at a respectful distance from her.

Of course, this is only an outline of this very complicated genesis story. I am citing it here just as the basis for further considerations. Can this story be useful for paleovisitological studies?

Some time ago the present author suggested the idea of astroengineering interference by a cosmic supercivilization in the evolution of the Sirius system. This assumption was based on the Indo-European myth of the heavenly blacksmiths, who are fighting and chaining up the monstrous Dog, dangerous for the Universe, as well as on some astrophysical data from the history of Sirius

(see: [4]). It is known in astronomy that a white dwarf arises from a red giant as this loses its mass. This process is usually accompanied by a slow ejection of a planetary nebula which eventually dissipates into space. But sometimes the remaining core of the red giant can retain a mass exceeding the so-called Chandrasekhar limit (about 1.3 Sun masses). This leads inevitably to disastrous self-compression of the core and its explosion as a Supernova. As a result, powerful streams of matter and radiation are ejected into the surrounding space.

If such an event had ever happened in the Sirius system, at a small (on the cosmic scale) distance from the Solar system, it might have been fatal for the terrestrial biosphere. My idea was that some highly developed supercivilization could have tried to remove the excess of stellar matter from Sirius B, thus saving life and civilization on Earth.

Really, the only thing we know for sure about the evolution of the Sirius system is the fact that Sirius B was once a red giant whose mass exceeded that of Sirius A (that's why the former evolved more rapidly). The initial orbit of Sirius B was, most likely, circular; now it is a highly elongated ellipse. This suggests that the mass loss was accompanied by some considerable disturbances. Some part of the "lost" matter probably contaminated the atmosphere of Sirius A (see: [5]). But the real course of events is still very unclear. The situation will seem even more involved if we bear in mind the possible presence of the second satellite in this system, as is asserted by the Dogon and confirmed by recent astrophysical data (see: [6]).

It would be certainly very helpful to study thoroughly the Sirius system with modern astronomical equipment (say, by radio interferometers with a very long baseline). But it appears that relevant (and rather interesting) information can also be found in those vestiges of the great mythologies of Europe, Asia and Africa which have survived till now, however odd and strange they may appear to us. This information cannot be taken at face value, for the myth is a very special form of thinking and knowledge, much different from our modern mentality. We should carefully analyze and interpret mythological stories and characters to understand their profound sense and real significance. There are on this road many pitfalls and false turnings, but there may also be found some road-signs and important hints. Let us go through some of them.

It is well known that the most common (though not the only) name for Sirius in the ancient world was "The Dog" (with the variants: the wolf, the fox, the jackal). The ancient Egyptians called it, in particular, the Starry Dog and identified the star with Anubis, the jackal- or dog-headed god of the dead. The North American Indian Cherokee tribe believed that this Dog awaited the souls of the dead on the Milky Way; the Blackfeet Indians named the star "Dog-face". The oldest Hindu name for Sirius was Sarama, "one of the Twin Watch-dogs of the Milky Way" [7, p. 119]. The Chinese knew this star as the Heavenly Wolf, and the Greeks as the Dog of Orion, or more specifically, as the dog Orthrus, a son of the monster Typhon. The Romans saw in it the Southern Cerberus, a watch-dog of their hell. As for the fennec Ogo, it is the smallest wild animal in the dog family (which hints probably at the small size of Sirius B).

What is more, Sirius represented not a decent house dog, but a terrible beast, monstrous and dangerous for everyone. It was related to death, hell and disaster. Orphrus' father Typhon was identified with the Egyptian evil god Seth (who, incidentally, was sometimes portrayed as a dog-headed creature) and was regarded as one of the monstrous adversaries of Zeus. The latter fought with Typhon and defeated him with much difficulty. Finally, Ogo himself is, as we know, a very harmful character in the Dogon mythology.

The worship of a dangerous dog was widespread in the ancient world, and this is rather strange: the dog was in fact the "first friend" of ancient man and played a very important part in his everyday life. Nonetheless, the fact remains: dogs (as well as wolves and jackals, which seems much more natural) were regarded as chthonian animals, guardians of the underworld. The "Inmost Story" of the Mongols contains a motif of monstrous metal dogs who feed on human flesh. The terrible dog Yarchuk, from Slavic mythology, had a wolf tooth in his mouth and two vipers under his lower lip. According to a Russian belief, a Solar eclipse happens when the heavenly wolf swallows the Sun (this idea was not unfamiliar to many other peoples).

The Ukrainians believed that Ursa Major was a team of horses with harness; "every night a black dog tries to bite through the harness, in order to destroy the world, but he does not achieve his disastrous aim: at dawn, when he runs to drink from a spring, the harness renews itself" [8, p. 168]. Another version of this story states that a dog was chained beside Ursa Minor; he tries in every way to gnaw through his iron chain, and when this happens, the world will perish. According to the famous ancient Greek philosopher Proclus, who lived in the 5th century A.D., "the fox star nibbles continuously at the thong of the yoke which holds together heaven and Earth"; the Germans added that "when the fox succeeds, the world will come to its end" [9, p. 385].

One can find some interesting details of this future event in the Nordic mythology. It has been called "Ragnaroek", and the wolf Fenrir, together with the great dog Garm, play leading

parts in it. Having snapped his fetters (which, incidentally, were made of nothing), Fenrir will devour the Sun and the supreme god Odin.

These fetters are of much importance for our subject. As was ascertained by the Russian philologist Dr. Vyacheslav Ivanov, the motif of the fight against the dragon in Slavic mythology grew out of an older motif of the hero-blacksmiths, chaining up a terrible dog. What is still more essential, "over the whole territory of Eurasia, this mythological complex is associated both with the Great Bear..., with a star near it as a dog which is dangerous for the Universe, and also with blacksmiths..." [10, p. 210]. One should remember that, although Sirius is far from this constellation in the firmament, it belongs to the same star-cluster.

Now, let us pay some attention to other Sirius names. There exists in mythology some kind of "principle of complementarity": you can describe a complex phenomenon, using a set of quite different, even incompatible, images. Thus, the first satellite of Sirius is at the same time an empty husk of a millet grain, and the Pale Fox himself. Just as much, Sirius may have been represented as the Dog, the Arrow, the Triangle, as well as in many other ways. This star was either the tip of the arrow (in Mesopotamia and Persia), or its target (in China, as well as in Ancient Egypt). The Chinese mythical emperor Huang-ti was both a smith and an archer; on an ancient picture he aims at the celestial jackal, located beside another star, which represent, probably, the A and B components of this system [9, ill. between pp. 216 and 217]. I would like to recall in this connection the hypothesis of the Russian scholar Dr. Igor Lissievich about possible paleovisits at the early stages of China's history. Huang-ti was the main character of these hypothetical events (see: [11]).

The Iranian mythology personified Sirius as Tishtrya, the divine archer (the corresponding character in the Vedic myths was Tishya). The name "Tishtrya" goes back to the Sanskrit term "three stars" and to an older Indo-European one of the same meaning. Some scholars prefer to see here a designation of the Belt of Orion, but it seems to be just an *ad hoc* conjecture. On the other hand, the name "three stars" is quite justified in terms of the Dogon concept of this stellar system. There is, by the way, a direct relationship between the word "Tishtrya" and the name of the hellish dog Cerberus.

Thus, there are in various parts of the world some traces of an ancient — and rather clear — concept of Sirius as a dangerous stellar system, consisting of three stars. Its transformation has been described, first, as the transition from Typhon (a fiery monster in rage, that is a red giant before its change into a Supernova) to Orphrus (a dangerous but suppressed beast, that is the core of the red giant in the process of its "calm" turning into a white dwarf). Second, the Dog is usually chained up by sacred blacksmiths, which can be interpreted as a description of astroengineering activity by a supercivilization. Nommos are also considered as heavenly blacksmiths, but they do not chain up the Fox; they simply circumcise him. This rather unexpected metaphor expresses very clearly the main point: it was necessary to remove the excess of stellar matter from Sirius B. The 240 years of increased brightness of the star looks like a slow explosion of this "cosmic bomb".

When did all this happen? Astrophysical data suggest that the lifetime of Sirius B as a white dwarf has been 30 to 100 million years. However, some classical authors, such as Ptolemy and Seneca, described Sirius as red, which is very different from its present white-bluish appearance. For instance, Seneca wrote: "...The redness of the Dog star is deeper, that of Mars milder, that of Jupiter nothing at all..." This enigma has been discussed by astronomers since the 18th century up to now, and it remains still unsolved. It is astrophysically very unlikely that Sirius B could have been a red giant as recently as 2000 years ago; but we cannot rule out entirely the possibility of lasting astroengineering works in this system. In any case, attempts to explain the red color of Sirius by some atmospheric causes are not very convincing. There is some evidence that the epithet "red" was not unusual for Sirius in the past. Thus, Tistrya was called "aurusha", what can be translated either as "white", or as "red". In Egyptian hieroglyphic writing, Sirius was depicted as a red triangle with a small semicircle and a five-pointed star near it (see Ref. 12). The Babylonians referenced to the star as "shining like copper". Finally, the Dogon represent *Po tolo* by a red stone (let us note it is precisely *Po tolo*, not *Sigi tolo* or *Emme ya tolo*, which is represented in such a way!).

In a recent work [13] R.Ceragioli has made an attempt to solve the riddle of Sirius' redness in the context of classical philology: the color red was in antiquity a token of danger. The most typical cultural pattern for Sirius connected it with fire, fever, rage, bloodshed, heat and other perils; that is why it may have been called red even in spite of evidence. It is questionable, however, if Ptolemy and Seneca were so much devoted to the cultural tradition that they did not trust their own eyes and took a color of Sirius' scintillations for the intrinsic color of the star. It seems more appropriate to assume that they did in fact see Sirius as red, even though this can have been just a temporary reddening related to some physical (or astroengineering?) processes in this stellar system (cf. [14]).

What is even more important, the solution suggested by R.Ceragioli does not provide the

answer to the main question: *why* the ancients attached so great "negative" importance to Sirius? Egyptian priests watched this star closely at its heliacal risings, believing that its bright and white color presaged abundance, and its redness betokened war. The inhabitants of the Greek island of Ceos, when expecting Sirius' rising "prayed for the north winds to cool the "Dog's" heat, which in their myths had once threatened to burn the world" [13, p. 615]. All that fits well with the "astroengineering hypothesis", raising at the same time some doubts: was the "cosmic bomb" discharged completely? Let us remember that the myth of the Dogon tells us that the blacksmiths only chained up the Dog, but it does not mean they rendered it quite harmless.

Therefore, we can suppose that alien astroengineering activities inside the Sirius system were finished only recently (if at all). Yet, they could have started in a much earlier epoch, even a few millions of years ago. However strange this may sound, we have another evidence of a fantastically deep historical memory of the Dogon: they know quite well that the lake Bosumtwi in Ghana was formed when a giant meteorite fell on the Earth [2, p. 196]. According to the results of a special investigation, this infall happened not later than 1.3, or even 1.6, million years ago. It is rather doubtful that somebody, living then on our planet (it was the epoch of Homo habilis and maybe of the early Pithecanthropus), could have retained this information and conveyed it to the future Homo sapiens. This knowledge may also be of paleovisit origin. Of course, we should not understand the Dogon mention of the "first year of the life of man on Earth", when, as they believe, Sirius B exploded, too literally, but it would be a mistake to reject these data a priori.

Now, what can we conclude from all that has been said above? The astroengineering hypothesis seems to be worthy of further investigation. It can hardly be proved just on the basis of mythological studies, but such studies can lead us to a preliminary outline of those distant (in time, as well as in space) events. Mythology may be regarded as a special language, which has preserved for us fragmentary data from the dawn of the world. I mean here by the "world" not only the Earth, but rather all our region of the cosmos — which has been called by the Dogon the "internal system of the stars". Events, that once took place in various parts of this region, were "projected" onto the firmament with its visible luminaries, becoming subsequently the subjects of mythological stories. These stories have interacted and become partly confused, so that it is now almost impossible to go this way back and reach the initial point. It only remains to rely on human imagination as another instrument of knowledge... At the same time, we should be very careful when trying to prove our assumptions. Usually they are more temporary tools than faithful models of reality. Thus, the concept of paleovisits as arrivals of extraterrestrial starships whose crews taught our ancestors to the fundamentals of civilized life and science, may prove to be uncritical adoption from science fiction stories, whereas the real situation was much more complicated.

There can have been some events in the history of the "internal star system", which we can neither understand as yet, nor even assume. There are, for example, in the Dogon mythology some hints at the multidimensional structure of the Universe. Moreover, Nommos seem to be not a "simple" supercivilization whose origin is similar to that of our civilization, only the level of development being much higher, but rather an independent branch of evolution of cosmic intelligent beings, very different from such planetary offspring as we humans are. It is very important to go from questions to reliable facts and convincing answers, but it may be still more important to go from answers to new questions.

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LETTER TO THE EDITOR

DID THE MAORI KNOW ABOUT THE RING OF JUPITER?

Sir,

Discussing the origin of the anomalously high astronomical knowledge of the Dogon [1], it would be very important to search for and, if found, to analyze similar anomalies in mythologies of other peoples whose levels of cultural development are comparable to that of the Dogon. In this connection I would like to draw the readers' attention to a strange astronomical conception discovered among the Maori, the native inhabitants of New Zealand, by the ethnologist E.Best (1856–1931). They call one of the planets that can be seen with the naked eye *Parearau* [2, pp. 43–44]. The structure of this word is rather intriguing: the word *pare* denotes a fillet or head-band, and *arau* means "entangled". "Her band quite surrounds her, hence she is called Parearau", – say the Maori of this heavenly body, considering it a companion or wife of *Kopu* – Venus. There is also another interesting statement: "That green-eyed star is Parearau; that is the reason why she wears her circlet." As E.Best indicates, one should see here a reference to the mourning-cap or head-band formerly worn by widows of Maoriland.

So, which of the planets of the Solar system was designated by the Maori as *Parearau*? E.Best gives us a straight answer to this question: "Four old natives in different localities of the Bay of Plenty applied the name to Jupiter."

However, in Best's time it seemed absurd to describe Jupiter as a planet surrounded by a circlet. Probably, for this reason alone a certain Stowell, whose words were cited by Best, believed that *Parearau* was nothing but Saturn with its rings [2, p. 43]. Not rejecting this interpretation on principle, Best put forward another one: the word *Parearau* might designate the cloud belts on Jupiter. This opinion was later supported by R.Collyns, a New Zealander and author of several Ancient Astronaut books [3, p. 145].

Today we can however re-evaluate these data. What is of prime importance, we can no more "fear" the idea of Jupiter surrounded by a circlet. Jupiter's ring was discovered by the Voyager-1 space probe in 1979. Therefore there are at present no reasons to doubt the identification of *Parearau* with this planet. Judging from Best's book, the Maori were quite sure of that. For a mythological-poetical mentality it would be quite natural to consider Jupiter – the third brightest heavenly luminary in the night sky after the Moon and Venus – as the "green-eyed" wife of the latter. (The gender assignment of the planets is here opposite to the "European" one.) On the other hand, when speaking of Jupiter as *Parearau* (lit.: "entangled by a fillet"), the Maori meant a ring rather than belts. Head gear is a separate object, external in relation to the "head" (= the planetary body). One can suppose that if the Maori had wished to describe (in their system of notions) Jupiter's cloud belts, they would have compared them to their own custom of decorating the face with colored patterns!

Now, everything seems to point to the fact that the Maori did know about the ring of Jupiter. This knowledge is, however, more anomalous than their supposed knowledge of Saturn's rings, and even more anomalous than many components of the Dogon astronomical lore.

Specifically, this fact cannot be explained away by the two hypotheses that were suggested to cope with the "Dogon problem" – the hypothesis of a primitive telescope [4] and that of a European missionary enlightening this African people about modern astronomy [5]. The Maori could not have seen the ring of Jupiter even if they had invented a telescope – simply because the ring cannot be observed from the Earth. As we know, it was discovered using spacecraft. To learn about the ring from a civilized traveller (say, from a missionary) would have been equally impossible. E.Best completed his field explorations as early as 1911, devoting the next two decades to analyzing the collected data and writing his monographs. At that period, science had no idea of Jupiter's ring, even a hypothetical one. (A little-known fact: the existence of the ring was predicted by the Ukrainian astronomer S.K.Vsekhsvyatskiy, based on repeated observations of a thin dark strip on the equator of Jupiter. Vsekhsvyatskiy interpreted this strip as the shadow of Jupiter's ring. But this happened only in the early 1960-s [6].)

All this suggests that the Maori could have obtained knowledge of this ring only from another civilization, one that surpassed mankind at least in the field of astronomy. Of course, to verify this hypothesis, we need weighty additional data proving that the New Zealand aborigines did in fact have contact with aliens. But the sole possible alternative explanation would be the hypothesis of a purely accidental coincidence between the mythological notion of *Parearau*, and our present-day knowledge of Jupiter. Such a possibility cannot be ruled out entirely, but to prove this supposition, it would be necessary to show the way in which the idea of Jupiter as "entangled" could have arisen in Maori mythology. In short, the enigma of *Parearau* can be solved only by a detailed professional investigation. Please consider this letter as an appeal for such an investigation.

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— Yuriy N. Morozov, Ph.D.

GARY BURGANSKY: IN MEMORIAM

From the USA has come the sad news of the death of Gary Eremeevich Burgansky — one of the pioneers of paleovisitological studies in the former USSR.

Gary Burgansky was born in 1936 in the Western Ukraine. His life path may be called typical for this place and age: no possibility to fully realize his talents, information shortage, permanent material difficulties, etc, etc. Working in the furniture industry, Gary Burgansky developed new types of furniture and wrote several books on the subject. I am sure that with his talent and abilities, he would have become a specialist of world class in this sphere — if he had lived in a different country.

Due to a grave illness, Gary lost his legs, but he did not lose his characteristic energy, buoyancy, and interest in everything new and unusual. His small apartment in Kiev became in the 80's a sort of discussion club where people would meet who took an interest in UFOs, paleovisits, parapsychological phenomena and other problems that were considered in the Soviet Union as "mad" or at least utterly unconventional. Somewhat later we succeeded in establishing in Kiev a Commission on Anomalous Phenomena, Gary being one of its founding fathers. I will always remember the joint work with him in this commission, where he was the life and soul of the paleovisit study group. Gary wrote articles on this problem, translated foreign materials that from time to time reached us from abroad, looked for new people interested in anomalistics... Being an engineer, he was especially interested in supposed extraterrestrial technogeneous objects — such as the vimanas of Ancient India, or the "land-rovers" of the Old Chinese "sons of the heavens". Wonderful recollections about our joint work on the book *Enigmas of the Antiquity* will remain in my memory until the very end.

In 1989 Gary Burgansky left Ukraine for the United States, but he did not break off his relations with Ukrainian enthusiasts of the paleovisit problem. A remarkably erudite, benevolent and outgoing person, he will remain for ever in our hearts.

— Rostislav S. Furduy, Ph.D.

(Continued from page 6)

for making small glass articles. It was produced with the help of a low-level technology that was characteristic of Russia from the middle of the 18th century till the middle of the 19th century. However, the Ball was not used for its proper purpose; probably, it was for some time serving as a toy.

The Glass Ball has no anomalous properties and, therefore, cannot be considered as anomalous.

At the same time, the circumstances, under which it was found (a layer of pure red clay at a depth of 7 meters, which is hardly in accordance with the Ball's conventional — and recent — origin) cast some doubt on this explanation. It would be desirable to determine the Ball's age and isotopic composition with direct methods. This would certainly allow us to come to the ultimate answer to this problem.

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